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Compliments of the Author

REMOVAL OF THE OSSICLES.

BY ✓

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I WISH in this paper to present the histories of some cases from which I have removed the ossicles, both for the cure of chronic suppuration of the middle ear, as well as to improve the hearing or to relieve troublesome tinnitus in so-called chronic middle ear catarrh. The cases are divided for convenience into two groups. Group first contains seventeen cases in which the operation was done to cure suppuration, and two cases of adhesive inflammation, the result of chronic suppuration, in which an improvement in hearing was the object sought.

Case I. Annie S., æt. 17. Brooklyn Eye and Ear Hospital, October 16, 1891. Occasionally recurring suppuration in A. D. since she was 2 or 3 years old. H. D. w. c/∞. B. C. better than A. C. A medium sized polypus protruded through a perforation in Shrapnell's membrane. Under ordinary treatment with snare, chromic acid, inflation, and syringing, the discharge would stop two or three weeks at a time, when the perforation would become again closed by a crust, with subsequent pain, and renewed discharge. January 17, 1892, in ether narcosis, the malleus and incus were removed, the former alone being partially carious. The ear healed within a month, with the formation of a cicatricial membrane. January 26, 1893, there has been no further discharge. H. D. w. 5/∞, an increase from c/∞.

Case II. Kate H., æt. 40. Brooklyn Eye and Ear Hospital, December 1, 1892. Occasionally recurring suppuration from A. S. for three years. H. D. w. c/∞, wh. 10'. A. C. better than B. C. Perforation of Shrapnell's membrane, through which protrude epithelial masses, a large quantity of which being removed by probe and syringing, some granulations come into view. The ordinary methods of treatment having failed to effect a cure, the malleus and incus were removed March 15, 1893, with cocaine as anesthetic. Both bones were carious, the incus much more affected than the malleus. The ear was quite healed within three weeks, and has remained healed. July 7, H. D. w. 2/∞, wh. 16'.

Case III. Florence H., æt. 15. Brooklyn Eye and Ear Hospital, March 10, 1893. Occasional discharge from A. D. the past three years. H. D. w. p/∞, wh. 5'. At the junction of the outer $\frac{1}{8}$ of canal with the inner $\frac{1}{8}$ was a new membrane shutting off the canal from the tympanic cavity, except for two small perforations along the anterior margin. March 31, has been having for three or four days severe pain in the ear and mastoid, and to-day there is a suspicious swelling of the posterior-superior canal wall, and



marked mastoid tenderness. April 1, pain still severe, and swelling of the upper canal wall increasing. Under ether the new membrane was excised, and a free incision made into the attic, which allowed of the escape of considerable pus. Bleeding was so profuse that nothing further was done except thorough syringing of the attic. April 3, no pain since the operation, no mastoid tenderness. H. D. w. $\frac{10}{100}$ wh. 30' +. On May 17, an offensive discharge continuing through a perforation of Shrapnell's membrane, under ether, a very necrotic malleus was removed, no trace of an incus being found. August 25, there is still some suppuration, which is, however, gradually lessening. This is probably kept up by the carious condition of the attic walls, which are gradually covering over, so that ultimate healing is to be looked for. H. D. w. $\frac{8}{100}$, wh. 30' +.

These three cases are recorded together as forming a group of attic suppuration with perforation of Shrapnell's membrane. Two of them appear to be permanently healed, the third is healing. In all, the hearing was improved, in case III very much so, a specially happy result, because the hearing in the other ear is greatly impaired by a previous suppuration,

A detailed history of cases IV, V, and VI, seems unnecessary. All were children under 6 years of age, who had suppuration $3\frac{1}{2}$ years, 4 years, and 5 months, respectively, with extensive destruction of bone, tympanic ring, mastoid, etc., and in each of whom a Stacke operation seemed best to meet the indications. As a part of this operation the larger ossicles, in each case considerably destroyed, were removed. Two of the cases are entirely healed with very fair hearing, and the third, which was operated upon May 20, 1893, is very nearly healed. These cases demonstrate the importance in such cases of a search for, and removal of, the affected bones to insure a complete success.

Case VII. Mr. W., æt. 19. Recommended to me by Dr. Browning, was first seen at my office October 17, 1892. During the previous winter, had been in Florida on account of trouble at the apex of one lung, but had returned apparently well. Has had discharge from A. S. three days, *not* preceded by pain. H. D. w. $\frac{1}{100}$ wh. 15'. There is a minute perforation of m. t. near anterior-inferior margin. Diagnosis, tubercular middle ear suppuration, in spite of the fact that the discharge was twice examined for tubercle bacilli with negative result. October 26, as patient is anxious to get away again to Florida, and the m. t. was breaking down rather than healing, in order to secure better drainage, and, if possible, avoid more serious involvement of the parts while he was away, under ether, the malleus and incus with all the membrane were removed, the tympanic cavity thoroughly touched up with 60 per cent sol. of lactic acid, and dusted with aristol. The lower end of manubrium was partially destroyed. Until November 6, he had so much dizziness as to confine him mostly to bed. November 2, the right m. t. became perforated, *without pain*, and with subsequent discharge. With general directions as to his care, he then went South.

January 20, 1893, he writes: "Left ear has stopped discharging, tinnitus much reduced. Right ear, slight discharge, thicker than formerly; tinnitus variable, but on the whole lessened. Hearing in both greatly improved. General health vastly improved." August 1, writes: "Both ears dry, general hearing good, tinnitus not as a rule troublesome."

In this case there was some doubt in my mind about recommending the operation so early, but the condition of the malleus, and the farther progress of the case, seem to me to have entirely justified the operation.

Cases VIII and IX. The two ears of Katie McC., æt. 16, who came to the Brooklyn Eye and Ear Hospital May 8, 1891, with a history of discharge from both ears ten years, following scarlatina. H. D. both, wh. and conv. 3'-5'. Large central perforation in each membrane. With two or three long intermissions patient was under observation and treatment until November 19, 1892, without marked improvement. On this date both mallei, decidedly carious, were removed under ether; neither incus could be found. November 29, both ears dry; hearing not improved. December 6, A. S. still dry. A. D. discharging slightly. From that time to the present, August 1, 1893, there has been from time to time slight discharge from both ears, and hearing worse than before operation. I believe a more or less fragmentary incus has been left behind in each ear, and propose an early operation for their removal.

Case X. Annie J., æt. 18. Brooklyn Eye and Ear Hospital, November 4, 1892. Hardness of hearing in A. S. five years, from whooping cough. Says there has never been any discharge. H. D. w. c/60, wh. 8'. Pus in the canal. M. t. mostly destroyed, manubrium bound to the promontory. Pus and granulations protruding from above and behind. November 26, under ether, removed malleus, incus and stapes, all of them more or less carious. Patient was extremely dizzy after the operation for more than a week, and felt very uncertain about walking up to December 12. Pain behind and below the ear, slight tenderness at mastoid apex. January 12, not seen during the past three weeks—no pain, moderate discharge, very troublesome tinnitus. January 30, no more discharge; still moderate tinnitus. H. D. w. $\frac{1}{80}$, wh. 21'. a marked improvement.

Case XI. Annie R., æt. 7. New York Post-Graduate Medical School, October 6, 1890. Discharge from A. S. eighteen months, following scarlatina. A large central perforation of m. t., with a granular mucous membrane. January 6, 1892, the ear had healed except in the attic, from which a small amount of offensive pus escaped. Malleus removed under ether; no incus could be found. When I last saw the case in May, 1892, the ear was still discharging a small quantity of offensive pus.

Case XII. Willie K., æt. 7. Brooklyn Eye and Ear Hospital, March 11, 1892. Discharge from both ears more than a year, following scarlatina. H. D. wh. R. 2', L. 4'. In both, a large central perforation of m. t., with a very granular mucous membrane. Treated by usual methods without success until January 14, 1893, when, under ether, the malleus, incus and stapes, all of them markedly carious, were removed from A. S. The ear has not thus far ceased to discharge, although the quantity is less than before operation. Last note, July 11, A. D. almost dry—A. S. discharging slightly.

H. D. wh. R & L, 15', a decided improvement. In this case the non-operated ear has done better than the operated one.

Case XIII. Paul M., æt. 10. Brooklyn Eye and Ear Hospital, November 15, 1892. Discharge from A. D. since infancy. H. D. w. $\frac{0}{100}$ wh. 10'. Large perforation of m. t., the carious manubrium projecting into perforation. Some granulations posteriorly. A large adenoid growth was removed from the naso-pharynx November 30. January 14, 1893, removed under ether a carious malleus from A. D., being unable to find either incus or stapes. Slight pain in the region of Eustachian tube, and in front of auricle, two or three days, moderate dizziness for a week, after the operation. When seen January 24, there is distinct right facial paralysis, which first appeared January 22, eight days after the operation. Tongue not affected. This began to lessen January 31, and by February 23 could not be detected. Discharge gradually lessened, until May 29, the ear was well. H. D. w. $\frac{c}{100}$, wh. 32'-35'.

In this case the interesting feature was the facial paralysis coming on the eighth day after the operation, and disappearing entirely, without local treatment, within four weeks.

Case XIV. Chas. A., æt. 27. Brooklyn Eye and Ear Hospital, January 21, 1893. Has advanced pulmonary tuberculosis. Brought with him a bone, the incus, which he had himself removed from A. S. about one month previously. Both ears have been suppurating sixteen months. H. D. w. R. $\frac{c}{100}$, L. $\frac{0}{100}$, wh. R. 7', L. 5'. Both membranes destroyed, with large sequestra internal to the tympanic cavities. On probing in A. S., a piece of loose bone was felt, which, on being removed with the forceps, proved to be the head, neck, and short process of the malleus. March 21, he brought with him the right incus which had come away while syringing. It became necessary early in April to open the left mastoid. This case is a curiosity, rather than anything else, from the spontaneous exfoliation of both incudes. Of course neither ear healed.

Case XV. Wm. W., æt. 27. Brooklyn Eye and Ear Hospital, February 21, 1893. Deafness and slight discharge from A. D. since he can remember. H. D. w. $\frac{0}{100}$, wh. $4\frac{1}{2}$ 2½', conv. 4'-6'. Small amount of pus in the canal. Large posterior perforation of m. t., into which the manubrium protrudes, and in which the incudo-stapedial articulation is visible. Recommended removal of the ossicles for the double purpose of stopping the discharge, and of improving the hearing. This was done February 25, 1893. There was moderate dizziness for one day; no pain; slight discharge until March 18, when the ear was entirely dry. Result, a cure of the supuration, no change in the hearing.

Case XVI. Mrs. F., æt. 30. Came to the office December 6, 1892. Discharge, slightly offensive, from A. S. eight years. H. D. w. $1\frac{1}{2}$ $\frac{0}{100}$, wh. 18'. B. C. better than A. C. Pus in the canal; large anterior-inferior perforation; mucous membrane granular; hammer handle much retracted. Under treatment, discharge became very slight but would not entirely cease. April 21, 1893, removed at the office with cocaine a carious malleus; could find no trace of the incus. Moderate, but by no means unbearable, pain. Just at the conclusion of the operation she became very dizzy, vomited freely, and had a cold clammy skin; was unable to leave the office for nearly

two hours; vomited frequently during the next thirty-six hours and had considerable headache. Dizziness was severe following the operation and was felt on quickly turning the head as late as July 6. Slight discharge from the ear until May 10, when she stopped coming until July 6; at this time there was a small central granulation which, after an application of chromic acid, promptly disappeared, so that the ear was entirely healed by July 17. H. D. w. $\frac{9}{60}$, wh. 16', a moderate diminution of hearing since the operation. The very unpleasant symptoms following immediately upon the operation seem to me to have been due in part at least to cocaine toxemia.

Case XVII. Miss W., from Massachusetts, æt. 11, recommended to me by Dr. West, was first seen September 18, 1890. Discharge from A. S. seven years, following scarlatina. H. D. w. $\frac{6}{60}$, increased after cleansing and inflation to $\frac{27}{60}$. M. t. gone except the anterior-superior quadrant containing the manubrium; mucous membrane moderately granular. The patient was seen at intervals of a few months, the ear discharging part of the time only. June 15, 1893, patient reports a pretty constant discharge for the past three months. H. D. w. $\frac{2}{60}$. June 27, under ether, the malleus and incus were removed, together with a small piece of bone which seemed to be a sequestrum thrown off from the incus. Patient left the city July 8. She had had no pain or dizziness, nor had the ear required syringing since the operation. Hearing improved for conversation.

Case XVIII. John F., reported elsewhere (Arch. of Otolaryngology, No. 3, 1892), as a case of fracture of the temporal bone, came to the Brooklyn Eye and Ear Hospital, February 4, 1892. Deaf in A. S. three years, following a blow on the side of head, at which time there was discharge for a few days. H. D. w. $\frac{9}{60}$, wh. 0'', loud words 3''. B. C. better than A. C. Large dry, anterior-inferior, perforation: hammer handle bound to promontory. February 10, under ether, removed the malleus and incus. February 11, conversational tones heard 6''. February 23, 4''-5''. March 4, wh. 6''; conv. 4''-6''. Ear entirely dry.

In this case the operation was more willingly undertaken to improve hearing because the right ear was useless since infancy, "the result of scarlatina."

Case XIX. Geo. S., æt. 22. Brooklyn Eye and Ear Hospital, October 13, 1891. Deafness in A. S. three years; about one year ago, discharged for a short time. H. D., w. $\frac{9}{60}$, wh. 4'. Pus in the canal; perforation in posterior-superior quadrant of m. t., through which protrudes a small polyp. Has nasal polypi and hypertrophied tonsils, all of which were removed. M. t. soon healed, the deafness remaining. January 4, 1893, H. D., w. $\frac{1}{60}$, wh. $\frac{4}{2}$ '. January 8, under ether, removed the malleus and stapes; no incus found. January 9, H. D., w. $\frac{p}{60}$, wh. and conv. 12'; very dizzy yesterday, not to-day; moderate bloody oozing. February 16, no further discharge; H. D., w. $\frac{9}{60}$, wh. 21', conv. 15'; when last seen April 10, ear entirely healed; H. D., w. $\frac{1p}{60}$, wh. 18'-21', conv. 15'-20'.

In these two cases, the after effects of suppuration, the operation was done purely to improve the hearing, with slight success in case XVIII, with marked success in No. XIX.

II. The second group consists of twelve cases of chronic middle ear catarrh, in which I have removed one or more of the ossicles for the improvement of hearing and relief of tinnitus.

Case XX. Miss T., æt. 22. Brooklyn Throat Hospital, January 15, 1890. Deaf in both ears since typhoid fever, three years ago. H. D., w., wh., and conv. 0 in both ears. Tuning fork not heard by air-conduction, but bone-conduction normal. Both membranes moderately retracted and opaque, with light reflexes much lessened. Treatment with catheter, vapor, etc., did no good. April 10, 1890, in chloroform narcosis, the malleus was removed from A. S. Bleeding very profuse, and incus was not removed; no special dizziness or pain followed the operation, and there was absolutely no change in the hearing.

Case XXI. Mrs. J., æt. 57. Brooklyn Eye and Ear Hospital, April 17, 1891. Progressive deafness and very annoying tinnitus in both ears five or six years. H. D., w. and wh. 0, in both ears; conv. R. 3", L. 8". The four lower forks of Hartmann's series heard better by bone, than by air-conduction in A. D.; the three lower forks likewise in A. S. But in both B. C. as well as A. C. was lowered, so that removal of the ossicles was suggested with more hope of helping the tinnitus than of improving the hearing. May 24, 1891, under ether, the malleus was removed from A. D., the incus escaping toward the antrum. Hearing very slightly, if at all, improved by the operation; tinnitus lessened, but not stopped.

These two cases were my first attempt at removing the ossicles and I have no doubt but that failure to secure the incus was due to insufficient skill on the part of the operator.

Case XXII. Annie D., æt. 14, came to my office May 22, 1891. Progressive dulness of hearing in both ears two years, worse in A. D., with frequently recurring pain and inconstant tinnitus in both. H. D., w. R. $\frac{3}{60}$, L. $\frac{8}{60}$; wh. R. 8", L. 12", conv. R. 18", L. 24". B. C. much better than A. C. She has been under a specialist's care from the inception of the trouble, two years ago, the constant treatment being Politzerization twice weekly during the two years. The membrane naturally showed the effect of this in a generally relaxed condition, with atrophic spots anterior to each malleus; light reflexes small and broken. The ears were put to rest temporarily and attention given to the general health, and to the nose and naso-pharynx, which had been neglected. Under this treatment for six weeks there was considerable improvement. October 24, 1892, patient returned, the hearing having recently grown worse again. H. D., w. R. $\frac{1}{60}$, L. $\frac{3}{60}$, wh. R. 30", L. 4'. Catheter, etc., used for a month with but little improvement. November 20, under ether, removed the incus and stapes from A. D. Patient was greatly troubled with vomiting and intense dizziness for one week, when the vomiting stopped, and the dizziness began to lessen and by December 5 was gone, tinnitus remaining as before the operation; site of operation healed over with a cicatricial membrane. January 3, 1893, H. D., w. $\frac{5}{60}$, wh. and conv. 38'.

Case XXIII. The left ear of Case XXII. The patient was so pleased with the result in A. D. that she requested the same operation on A. S. January 8, 1893, under ether, removed incus and stapes from A. S. Moderate dizziness three or four days. Some pain behind and below the ear for a week. Slight bloody discharge, becoming purulent, and lasting ten days. February 23, some tinnitus remains in both ears. H. D., w. R. $\frac{14}{60}$, L. $\frac{24}{60}$, wh. and conv. R. & L. 42'. April 16, has had for a few days a head-cold with very troublesome tinnitus, worse in A. S. H. D., wh. R. 38',

L. 35'. July 28, tinnitus same as before the operations. H. D., w. R. $\frac{7}{60}$, L. $\frac{10}{60}$, wh. and conv. R. 42', L. 40'.

Case XXIV. Mrs. H. æt. 53, came to my office December 27, 1892, with history of progressive deafness in A. S. six years. H. D., w. $\frac{2}{60}$, wh. 6'. B. C. better than A. C. Membrane much retracted, quite opaque, l. r. a hazy, central point. Eust. tube not free until after using a bougie. Treated by catheter. bougie, and vapor until January 11, 1893, when H. D., w. $\frac{2}{60}$, wh. 16', a gain, but not sufficient to make the ear practically useful. On this date removed under ether, with the utmost difficulty, owing to very free persisting hemorrhage, the malleus, incus, and head and crura of stapes. No subsequent pain or dizziness. January 18, H. D., wh. 18'-20'. After this for a time there was considerable swelling and redness of the posterior-superior canal wall (localized periostitis?), and the hearing was worse. But at the time of patient's discharge, February 9, it was for the whisper back to its highest point, 16'-18', previous to operation.

Case XXV. Mrs. S., æt. 50, came to my office January 20, 1893. Deaf in A. D. eight or ten years; in A. S. twenty-four years; slight tinnitus; hears markedly better in a noise. H. D., w. R. $1\frac{1}{2}/60$, L. $\frac{15}{60}$, wh. R. 7', L. 20'+. For the four lower Hartmann forks B. C. much better than A. C. in both, and in both for the upper fork B. C.=A. C. Right m. t. not retracted, but moderately opaque, and having a small l. r. Left m. t. slightly retracted and opaque. with small l. r. There being no improvement with ordinary treatment by February 15, H. D., w. $2\frac{1}{2}/60$, wh. 8'-12', conv. 7'-9', removal of stapes was undertaken under ether. The crura broke, leaving the foot-plate in position, and the incus not being in the way was left. February 16, slight pain in the ear two or three hours after the operation; no dizziness; says every one seems to her to be talking very loud. H. D., w. $\frac{2}{60}$, wh. 15', conv. 7'-9'. February 18, H. D., wh. 8', conv. 6'. When last seen, March 29, perforation still open, noise about as before the operation; she notices no difference in the hearing. H. D., w. $\frac{1}{60}$, wh. 11'-15', conv. 7'-9'.

Case XXVI. Miss F., æt. 22, came to my office February 11, 1893. Progressive deafness in both ears three years, worse in A. S. Had occasional discharge from the ears during childhood, but none within the past three years. H. D., w. R. $\frac{5}{60}$, L. $\frac{c}{60}$, wh. R. 20', L. 4'. All five Hartmann forks heard better by bone conduction in A. S. Left m. t., great retraction and opacity, two cicatrices, one in Shrapnell's membrane, and one posterior to manubrium. Has also moderate hypertrophy of naso-pharyngeal tonsil. Just before operation, February 25, H. D., L. w. $\frac{1}{4}/60$, wh. $3\frac{1}{2}'-5'$, conv. $4\frac{1}{2}'-6'$. Under ether, removed the malleus, incus, and stapes except the foot-plate, the crura breaking. February 27, very dizzy yesterday, slightly so to-day; slight bloody oozing. H. D., wh. 9', conv. 7'. March 1, H. D., w. $\frac{1}{60}$, wh. 24', conv. 12'. March 25, H. D., w. $\frac{18}{60}$, wh. 42'. April 19, a new membrane has formed; H. D., w. R. $\frac{48}{60}$, L. $\frac{16}{60}$, wh. R. 54', L. 42'-50'.

Case XXVII. Mrs. T., æt. 38. Brooklyn Eye and Ear Hospital, February 21, 1893. Progressive deafness in both ears ten years. H. D., w. R. $\frac{9}{60}$, L. $\frac{9}{60}$, wh. R. 6'', L. 0, conv. R. 18'', L. 16''. Tuning fork better by A. C. in A. D., by B. C. in A. S. Both membranes much retracted and very opaque; no l. r. Thus with better bone-conduction and poorer hearing A. S. was the ear operated upon March 1, with cocaine as anesthetic; malleus, incus, and all except the foot-plate of the stapes were removed,

with only moderate pain. Some dizziness during, and for three or four days, after the operation. March 3, some shooting pain and soreness down the side of the neck. H. D., wh. 5'-6', conv. 7'. March 10, moderate perioritis along posterior-superior canal wall; severe pain over side of head and down into throat. Taste is bad, (chorda tympani affected). March 12, severe pain over side of head; bad taste in mouth; offensive breath; and offensive pus in the ear; slight tenderness over mastoid apex; great tenderness in the groove between mastoid and maxilla, and down the side of neck. March 28, the above symptoms have gradually subsided, until now nothing is left except slight tenderness over side of head, and uncomfortable feeling in the throat. A new membrane has formed. H. D., wh. 20"-24". July 13, has had for three weeks a curious numb, tingling feeling of the left half of the body; has felt more or less "light-headed ever since the operation." H. D., w. $\frac{0}{100}$, wh. 10"-16", conv. 5', a considerable gain, appreciable to the patient.

Case XXVIII. Mrs. C., æt. 54. Brooklyn Eye and Ear Hospital, March 3, 1893. Progressive deafness in both ears twenty years. H. D., w. R. $\frac{0}{100}$, L. $\frac{0}{100}$, wh. R. 10", L. 48". B. C. better in both ears for all five forks. Right m. t. moderately retracted and opaque; l. r. small and central. Left m. t. moderately retracted, very opaque; no l. r. March 4, removed under cocaine the incus, head and crura of stapes, from A. D., the latter breaking while trying to disarticulate, so that the two bones came out as one piece. Pain during the operation only trifling; no dizziness. Immediately afterward, H. D., wh. 6', conv. 7'. March 7, considerable bloody oozing; pretty dizzy two days; H. D., wh. 20"; not so much tinnitus since the operation. March 10, "feels dizzy when she talks;" has autophonia; no pain; moderate discharge; H. D., w. $\frac{0}{100}$, wh. 24". Not seen since. A slight increase in hearing, not appreciable to patient.

Case XXIX. Mrs. K., æt. 32. Brooklyn Eye and Ear Hospital, February 23, 1893. Progressive deafness in both ears three years, following "grippe." H. D., w. R. $\frac{2}{100}$, L. $\frac{1}{100}$, wh. R. 14', L. 5'. Tuning forks, B. C. better in both for the four lower forks, the upper fork being better by A. C. Left m. t. moderately retracted and opaque; l. r. small; incudo-stapedial articulation visible through m. t. Just before operation, H. D. L. w. $\frac{c}{100}$, wh. 5'-10', conv. 3'-5'. March 8, under ether, removed incus, head and crura of stapes from A. S., the crura breaking in spite of efforts at loosening the foot-plate before making traction. March 10, says she heard much better immediately after coming out of ether, but yesterday and to-day sounds are muffled. H. D., w. $\frac{1}{100}$, wh. 6', conv. 3'. March 20, H. D., w. $\frac{3}{100}$, wh. 10'-13', conv. 6'-8'. Ear dry. Until March 22, two weeks after the operation, patient progressed comfortably. On this date woke with ears feeling muffled; moderate pain in A. S. March 23, pain severe last night, and woke once with a profuse discharge coming from the ear. Bony canal and m. t. very red, swollen and sensitive. March 25; this afternoon pain has been very severe, with considerable discharge; great tenderness in front of, and around the ear. March 28, very severe pain since last note over side of head, and down the neck; very tender in front of, and below the ear; canal considerably narrowed by swelling of the anterior wall; chewing and, part of the time, swallowing, caused pain; tongue coated, breath offensive, lips covered with dark brown crusts; considerable dizziness; no vomiting;

bowels constipated. Not seen again until August 1, when she reports that for three or four weeks after last note she was sick in bed with a continuation of the symptoms above noted. Then gradually improved. She is at times still dizzy; hears worse in both ears than before the operation; H. D., w. R. $\frac{1}{4}/60$, L. $0/60$, wh. R. 6'-8', L. 1', a distinct loss of hearing.

A striking similarity will be noticed between the symptoms of this case and those of case XXVII, except that in this case there were no unpleasant symptoms until two weeks after the operation. It has seemed to me better to simply record the cases, leaving open for discussion their etiology, which, I confess, is not altogether clear to my own mind.

Case XXX. Miss B., æt. 44. Brooklyn Eye and Ear Hospital, March 3, 1893. Deaf in both ears, with slight tinnitus, for twelve years. H. D., w. R. & L. $0/60$, wh. R. 14'', L. 15'', conv. R. 14'', L. 12''. Tuning forks: in A. D., four lower forks better by B. C., highest by A. C.; in A. S., all five forks heard better by B. C. Right m. t., moderate retraction and opacity; l. r. small, hazy, and central. Left m. t., considerable retraction and opacity; l. r. small. March 11, removed under ether, malleus, incus, head and crura of stapes from A. S.; the crura breaking in spite of the gentlest manipulation. March 12, well marked left facial paralysis. March 13, paralysis not so marked as yesterday. Patient has seemed very drowsy ever since the operation. Hearing unchanged. May 12, patient has been for the past month having electricity applied in the nervous department of the hospital: paralysis has perceptibly diminished. July 25, under continued use of electricity paralysis has entirely disappeared from lower part of face. The eye does not yet shut perfectly, but is improving. Hearing, the same as before operation.

In this case the striking feature is the facial paralysis, coming on within twelve hours of the operation. As the case required less manipulation than many of them, I am inclined to think it must have been one of those unusual cases where the bony wall between the tympanic cavity and the aquaeductus fallopii was wanting.

Case XXXVI. Miss K., æt. 28. Brooklyn Eye and Ear Hospital, March 28, 1893. Deaf in A. D. since she was a child; in A. S. ten days (?). Hears decidedly better in a noise, and much worse when tired or nervous. H. D., w. R. $c/60$, L. $p/60$, wh. R. $3\frac{1}{2}'$, L. 7'-12', conv. R. 2', L. 4'. April 1, under cocaine, removed from A. D. malleus, incus, and displaced stapes (probably head and crura!), which could not afterward be found. All the ossicles were particularly brittle. The principal complication was a prolapse of the chorda tympani, which was very much in the way. H. D. at once improved to w. $2/60$, wh. 15'. April 3, "everything tastes alike" (irritation of chorda tympani); no pain, no dizziness, no discharge. H. D., w. $2\frac{1}{2}/60$, wh. 21', conv. 5'. April 5, food tastes good, and tongue feels all right; no discharge. H. D., w. $\frac{1}{2}/60$, wh. 21', conv. 5'-6'. When last seen, June 5, feels that her hearing is decidedly improved; H. D., w. R. $\frac{1}{2}/60$, L. $c/60$, wh. R. 23', L. 14'-20', conv. R. 6', L. 3', so that the operated ear is now the better of the two.

It seems to me the following conclusions are justifiable :

1. Cocaine can be used with advantage as the anesthetic in a considerable proportion both of suppurative and catarrhal cases.

2. Removal of the malleus alone is not, as a rule, sufficient in either class of cases.

3. Removal of the malleus and incus will cure a large majority of the suppurative cases ; and improves hearing in about one-half of the cases.

4. Removal even of all three ossicles will sometimes fail to cure middle ear suppuration.

5. Removal of stapes entire gives better results than when the foot-plate is left *in situ*, although a moderate proportion of the latter class show very good results.

6. Although unpleasant symptoms occur in a by no means small proportion of cases, (eight out of thirty-one), such as severe, and prolonged dizziness, 4 ; vomiting, 2 ; facial paralysis, 2, once, quite temporary, once, more lasting ; symptoms simulating, if not indeed indicating, meningeal irritation, 2 ; still I believe the operation to be a perfectly proper one and shall continue to perform it. What we need is more knowledge as to the cases in which it should be performed, and this holds especially as to removal of the stapes.

7. Reactive inflammation seems as likely to occur in cases of partial excision of m. t., postero-superior quadrant, as in total excision with removal of all the ossicles.

8. In a majority of cases tinnitus has been unchanged.

The work done and the results obtained can perhaps be most readily seen by a glance at the subjoined table, in which are tabulated the bones removed, with the corresponding results, it being understood that the word stapes, as used therein, means either the whole bone, or part of it.

			{ Cured, 2; hearing { Improved, 1. Worse, 1.
Malleus, 9	{ For Suppuration, 7	{ Not cured, 5; hearing { Improved, 1. Not improved, 2. Worse, 2.	
	{ For Catarrh, 2; hearing not improved, 2.		
		{ Cured, 7; hearing { Improved, 4. Not improved, 3.	
Malleus and Incus, 9	{ For Suppuration, 8	{ Not cured, 1; hearing, not improved.	
	{ For Adhesive Inflammation, 1; hearing, improved.		
	{ For Catarrh, 0.		
		{ Cured, 1; hearing improved. Not cured, 1; hearing improved.	
Malleus, Incus and Stapes, 7	{ For Suppuration, 2	{ Hearing improved, 3. Hearing not improved, 2.	
	{ For Catarrh, 5		
Malleus and Stapes, 1; for Adhesive Inflammation; hearing, improved.			
	{ For Suppuration, 0	{ Improved, 2. Not improved, 1. Worse, 1.	
Incus and Stapes, 4	{ For Catarrh, 4; hearing		
Stapes, 1; for Catarrh; hearing, not improved.			

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